

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: xx/xx/2019

Region: Fayetteville Regional Office
County: Anson
NC Facility ID: 0400052
Inspector's Name: Mitch Revels
Date of Last Inspection: 10/17/2018
Compliance Code: 3 / Compliance - inspection

Facility Data Applicant (Facility's Name): Anson County Waste Management Facility Facility Address: Anson County Waste Management Facility 375 Dozer Drive Polkton, NC 28135 SIC: 4953 / Refuse Systems NAICS: 562212 / Solid Waste Landfill Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V				Permit Applicability (this application only) SIP: 15A NCAC 02D .0516, .0521, .0524, .1100, .1806, 02Q .0711 NSPS: Subpart XXX NESHAP: Subpart CCCCCC PSD: N/A PSD Avoidance: N/A NC Toxics: Update model based on increased waste placement rate 112(r): N/A Other: N/A					
Contact Data				Application Data					
Facility Contact Tyler Fitzgerald District Manager (704) 694-6900 375 Dozer Drive Polkton, NC 28135	Authorized Contact Tyler Fitzgerald District Manager (704) 694-6900 375 Dozer Drive Polkton, NC 28135	Technical Contact Lana Brown Eastern Region Env. Manager (901) 500-1812 265 Brookview Centre Way Memphis, TN 37919	Application Number: 0400052.17A Date Received: 11/15/2017 Application Type: Renewal/Modification Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 09835/T03 Existing Permit Issue Date: 08/22/2014 Existing Permit Expiration Date: 08/31/2018						
Total Actual emissions in TONS/YEAR:									
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP		
2017	0.7300	4.36	2.83	23.70	1.07	2.61	0.8320 [Toluene]		
2016	0.6700	4.03	2.35	21.91	0.9900	2.25	0.7066 [Toluene]		
2015	0.5500	3.27	2.38	17.77	0.8000	2.13	0.6868 [Toluene]		
2014	0.4600	2.73	2.02	14.86	0.6700	1.87	0.6070 [Toluene]		
2013	0.5500	3.28	1.30	17.86	0.8100	1.31	0.3831 [Toluene]		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> Review Engineer: Joshua L. Harris Review Engineer's Signature: _____ Date: _____ </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> Comments / Recommendations: Issue 09835/T04 Permit Issue Date: xx/xx/2019 Permit Expiration Date: xx/xx/2024 </td> </tr> </table>								Review Engineer: Joshua L. Harris Review Engineer's Signature: _____ Date: _____	Comments / Recommendations: Issue 09835/T04 Permit Issue Date: xx/xx/2019 Permit Expiration Date: xx/xx/2024
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1. Purpose of Application

The Anson Waste Management Facility (AWMF) is an active Municipal Solid Waste (MSW) landfill located in Polkton, Anson County, North Carolina. AWMF is requesting renewal of their current Title V permit with modifications. Application No. 0400052.17A was timely received by the Division of Air Quality, Fayetteville Regional Office (FRO) on November 15, 2017, and an addendum was received on August 15, 2018. This application is required to go through the 30-day public and the 45-day EPA review.

2. Facility Description

The Anson County Waste Management Facility is a Municipal Solid Waste landfill that began accepting waste in 2001. The facility covers approximately 1,163 acres, and accepts municipal, commercial, residential, and industrial waste, which is placed in a 133-acre area which is permitted for solid waste disposal. The most recent Solid Waste Permit, Permit No. 0403, was issued on March 26, 2018, authorized construction of the Phase 3 and 4 lateral expansions, and increased the design capacity to 10,428,555 Mg, based on a waste density of 1,062 lb/yd³. The Solid Waste Permit is a “life-of-site” permit, and authorizes operation until December 12, 2040, or until the landfill reaches its final elevations, whichever comes first.

The recent expansion triggered applicability of NSPS Subpart XXX, and the landfill has submitted the required initial design capacity and NMOC emission rate reports. The initial NMOC emission rate report showed that NMOC emissions exceed the 34 Mg/yr threshold for which a GCCS is required to be installed and operated. The landfill intends to conduct Tier 2 testing to determine a site-specific NMOC concentration for the purposes of showing that NMOC emissions are below the threshold, though previous Tier 2 samples conducted for compliance with NSPS WWW showed the landfill’s NMOC emissions to already be in excess of 34 Mg/yr. The facility already has a GCCS installed in portions of the landfill, and routes collected gas to a 2,500 scfm candle stick flare.

3. Application Chronology

- 11/15/17 The Fayetteville Regional Office (FRO) received the application for permit renewal with a modification, including the required \$929 permit modification fee. FRO forwarded copies of the application to the Raleigh Central Office (RCO).
- 11/17/17 RCO received three copies of the permit application. There was no request to keep any information confidential. The application appeared to be complete for processing as of November 15, 2017.
- 11/17/17 RCO sent the facility a letter acknowledging receipt of the permit application.
- 12/04/17 Air Permit Application No. 0400052.17A reassigned to Joshua Harris.
- 03/26/18 The Division of Waste Management, Solid Waste Section, issued a Permit to Construct for the Phase 3 and 4 expansions, Permit No. 0403-MSWLF-2010.

- 04/27/18 Joshua Harris sent an email to Juene Franklin with questions regarding the gasoline tank, toxic emission calculations for the landfill, and about the recently issued permit to construct from Solid Waste for a lateral expansion. Mr. Franklin responded, and followed-up with a phone call. In the email, Mr. Franklin indicated that the facility would like to keep the gasoline tank as an insignificant activity. Mr. Franklin will find out if the landfill has commenced construction on the expansion. Mr. Harris will research the modeling at the facility, and if it needs to be updated for new expansions.
- 05/01/18 Joshua Harris sent an email to Juene Franklin regarding modeling and requested additional information necessary to refine toxics modeling. Mr. Harris also requested updated calculations for emissions to account for the total planned design capacity of the landfill through end-of-life.
- 06/06/18 Joshua Harris sent an email to Juene Franklin requesting an update on the status of the previous requests. Mr. Franklin responded, stating that construction on the Phase 3 expansion commenced on May 9, 2018, triggering applicability of NSPS Subpart XXX. Mr. Franklin is also in the process of gathering information for a request to have DAQ conduct modeling for toxics.
- 06/07/18 Joshua Harris sent an email to Juene Franklin requesting that he submit an amended permit application citing applicability of NSPS Subpart XXX. Mr. Franklin responded and stated that he will submit the requested application documents as well as updated emissions calculations and a request for DAQ to perform modeling for toxics.
- 08/06/18 Joshua Harris received an email from Juene Franklin with the initial design capacity and NMOC emission rate report attached; the original document was sent to the FRO, postmarked August 3, 2018. The reports indicated that the NMOC emission rate exceeded the 34 Mg/yr threshold using the Tier 1 methodology, and that the landfill will conduct a Tier 2 test to establish a site-specific NMOC concentration.
- Mr. Franklin also stated in his email that he is in the process of preparing the requested amendment to the permit application.
- 08/15/18 Joshua Harris received an addendum to the original permit application, to include information regarding the increase in design capacity and emissions calculations.
- 10/08/18 Joshua Harris received the requested modeling information via email and noted that there were no calculations for H₂S and that the D3 form was missing.
- 10/18/18 Joshua Harris spoke with Juene Franklin regarding the missing D3 form and requested emission rate calculations for H₂S which was omitted.
- 10/19/18 Joshua Harris received the D3 form and additional calculations Juene Franklin via email.
- 10/29/18 The dispersion modeling analysis was completed by Alex Zarnowski, AQAB.
- 11/07/18 Joshua Harris sent copies of the draft permit and review documents to Booker Pullen for comments.

- 11/15/18 Booker Pullen provided minor editorial comments.
- 11/15/18 Joshua Harris sent copies of the draft permit and review documents to Greg Reeves, FRO, and Samir Parekh, Stationary Sources Compliance Branch, for comments.
- 11/28/18 Samir Parekh responded with no comments.
- 11/29/18 FRO responded with no comments.
- 11/29/18 Joshua Harris sent copies of the draft permit and review documents to Tyler Fitzgerald and Juene Franklin for comments.
- 12/17/18 Joshua Harris received comments from Juene Franklin. Mr. Franklin's comments included updated language to the review document regarding Tier 2 testing at the landfill, a correction to the heat value of LFG, which impacted NO_x and CO emission rate calculations, and small increases in the emission limits for benzene and vinyl chloride. All of Mr. Franklin's comments were incorporated into the permit and review documents. The increased toxics limitations appeared to be within rounding error of the modeled emission rates and have negligible effects on the impacts at the property boundaries, so the updated permit limitations are protective of the AALs.
- 12/18/18 Joshua Harris sent revised documents to Juene Franklin via email.
- 12/20/18 Juene Franklin responded to the revised documents and pointed out a comment that was missed in the revision. Mr. Franklin requested that the statement "Compliance with the NSPS XXX regulations referenced in Section 3 of this permit will be required when applicable," be included in the NSPS Subpart XXX condition in Section 2.1 A.3.a. Mr. Harris responded the next day, and Mr. Franklin expressed concerns about the possibility of an inspector citing the facility for non-compliance with requirements that are not yet applicable since the facility has a system that was installed voluntarily and is still working through the regulatory timeline of the NSPS. A version of the statement has been included with the appropriate citation for the permit section.
- 01/xx/19 30-day Public notice and 45-day EPA review periods begin.
- Xx/xx/19 Public notice period ends.
- Xx/xx/19 EPA review period ends.
- Xx/xx/19 Air Quality Permit No. 09835T04 issued.

4. Table of Changes to Existing Permit No. 09835T03

Page No(s).	Section	Description of Changes
Global	Global	<ul style="list-style-type: none"> Updated dates and permit revision numbers. Reorganized permit conditions to list in order by regulatory citation. Updated conditions to reflect the most up-to-date permitting language. Updated cross-references throughout.
Cover Letter	Cover Letter	Updated letterhead.
Attachment	Attachment	<ul style="list-style-type: none"> Replaced IES-3A with IES-3B, and made note in table regarding the applicability of MACT CCCCCC to the tank. Updated website link.
3	1	<ul style="list-style-type: none"> Changed citation in table from NSPS Subpart WWW to Subpart XXX. Removed table note showing the gas collection and control system as a voluntary system. Updated heat input rate of the flare to 75.9 mmBtu/hr based on a 506 Btu/scf heat value for LFG rather than 500 Btu/scf.
3	2.1 A. (table)	Updated limits/standards and applicable regulation for NMOC emissions.
-----	-----	Removed permit condition for NSPS Subpart WWW.
4-13	2.1 A.3.	Added permit condition for NSPS Subpart XXX.
14	2.1 A.4.	Added "State-Enforceable Only" before 15A NCAC 02D .1806 condition.
14	2.1 A.5.a.	Updated limits for Toxic Air Pollutants in 15A NCAC 02D .1100 condition to reflect most recent modeling.
15	2.1 A.6.d.	<ul style="list-style-type: none"> Removed dichlorodifluoromethane as a pollutant in the 15A NCAC 02Q .0711 Table since it has been removed from the regulation at the recommendation of the NC Science Advisory Board Added rows for chlorobenzene and trichloroethylene which were previously omitted.
16-25	3	Updated General Conditions to latest version (Version 5.3).

5. Changes in Equipment

- End-dated the 1,000-gallon gasoline above ground storage tank (ID No. IES-3A) as this tank has been removed and replaced with a smaller tank.
- Added 500-gallon gasoline above ground storage tank to the facility's insignificant/exempt activities list as ID No. IES-3B and included a note that it is subject to NESHAP Subpart CCCCCC.
- Updated description of the flare to reflect a heat input rate of 75.9 mmBtu/hr based on a LFG heat value of 506 Btu/scf rather than 500 Btu/scf.

Title V Equipment Editor is up-to-date for the changes described above.

The facility's permitted emission sources are as follows:

Emission Source ID	Emission Source Description	Control Device ID	Control System Description
ES-1 NSPS XXX	One municipal solid waste landfill	GCCS-1 CD-1	Gas collection and control system Candle stick type flare (2,500 scfm, 75.9 million Btu per hour heat input at 506 Btu/ft ³ heat rate of landfill gas)

The facility's insignificant/exempt activities are as follows:

Emission Source ID No.	Emission Source Description
IES-2A	Two Diesel fuel above ground storage tanks (12,000-gallon capacity each)
IES-3B MACT CCCCCC	Gasoline above ground storage tank (500-gallon capacity)
IES-4A	Two leachate above ground storage tanks (250,000-gallon capacity each)

6. NSPS, NESHAP, PSD, 112(r), CAM & Attainment Status

- **NSPS –**
 - ✓ The MSW landfill (ID No. ES-1) is subject to 40 CFR 60, Subpart XXX "Municipal Solid Waste Landfills that Commenced Construction, Reconstruction or Modification after July 17, 2014," since it has been modified after July 17, 2014. The Division of Waste Management, Solid Waste Section, issued a permit to construct for the Phase 3 and 4 expansions on March 26, 2018, and construction on the Phase 3 expansion commenced on May 9, 2018.
 - ✓ The MSW landfill (ID No. ES-1) is NOT currently subject to 40 CFR 60, Subpart WWW "Municipal Solid Waste Landfills," since the facility is subject to NSPS Subpart XXX, which supersedes Subpart WWW. The existing permit condition for NSPS Subpart WWW will be removed.

- **NESHAP –**

- ✓ The MSW landfill (ID No. ES-1) is NOT subject to 40 CFR 63, Subpart AAAA “Municipal Solid Waste Landfills,” because it has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m³, but does not yet have estimated uncontrolled NMOC emissions equal to or greater than 50 Mg/yr. The facility’s projected NMOC emission rates from prior Tier 2 testing under NSPS WWW indicate that it may cross the 50 Mg/yr threshold in CY 2021 or 2022, at which point, Subpart AAAA applicability will be triggered.
- ✓ The gasoline storage tank (ID No. IES-3B) is subject to 40 CFR 63, Subpart CCCCCC “Gasoline Dispensing Facilities” since the facility is an area source of HAPs, and the facility meets the following definition of a gasoline dispensing facility as any stationary facility which dispenses gasoline into the tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. Gasoline storage tanks are listed as affected sources under §63.1111(a), and there are no size distinctions.

Since IES-3B is an insignificant activity, there is no permit condition, however the facility is still required to comply with Subpart CCCCCC. The facility has the general duty to minimize emissions by operating and maintaining affected sources, and their associated air pollution control and monitoring equipment, in a manner consistent with safety and good air pollution practices for minimizing emissions. In addition, since the facility’s throughput is expected to be less than 10,000 gallons per month, the facility is subject to the requirements of §63.11116, which states that the facility must handle the gasoline in a manner which will not result in vapor release to the atmosphere for an extended period of time. Measures to be taken include, but are not limited to:

- Minimize gasoline spills;
- Clean up spills as expeditiously as practicable;
- Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use; and
- Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices.

There are no notification or reporting requirements for facilities with a throughput of less than 10,000 gallons per month, however, the facility shall supply records of gasoline throughput within 24 hours of a request by DAQ. Additionally, should the facility’s monthly gasoline throughput exceed 10,000 gallons, the facility will be subject to the requirements of §63.11117 for facilities with a monthly throughput of 10,000 gallons of gasoline or more, or §63.11118 for facilities with a monthly throughput of 100,000 gallons of gasoline or more, whichever is applicable, and must meet the applicable notification, testing, monitoring, recordkeeping, and reporting requirements. If an affected source’s throughput ever exceeds an applicable throughput threshold, the affected source will remain subject to the requirements for sources above the threshold, even if the affected source throughput later falls below the applicable source threshold. [§63.1111(i)]

- **PSD –** The landfill’s potential emissions do not exceed PSD permitting thresholds.

- ✓ Anson County has not triggered increment tracking under PSD.

- **112(r)** – The facility does not store any of the listed 112(r) chemicals in amounts that exceed the threshold quantities. Therefore, the facility is not required to maintain a written Risk Management Plan (RMP).
- **CAM** – CAM does not apply to this facility.
- **Attainment status** – Anson County is in attainment for all criteria pollutants.

7. Regulatory Review

The following permit condition has been removed from the facility's permit as it is no longer applicable:

15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart WWW

The Anson County Waste Management Facility is subject to the following air quality regulations in addition to the General Conditions:

15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources

15A NCAC 02D .0521: Control of Visible Emissions

15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart XXX

15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions

15A NCAC 02D .1100: Control of Toxic Air Pollutants

15A NCAC 02Q .0711: Emission Rates Requiring a Permit

15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources

The facility's flare (ID No. CD-1) is currently the only subject source at the facility. The SO₂ emission rate for the facility's combustion sources shall not exceed 2.3 pounds of SO₂ per mmBtu heat input. Using the methodology in AP-42 Chapter 2.4, the generation rate of sulfur compounds can be determined, and subsequently the emission rate of SO₂ calculated. Assuming the flare is operating at its maximum capacity, and that the heat value of LFG generated by the landfill is 506 Btu per cubic foot, the maximum SO₂ emission rate is 0.0076 pounds per mmBtu. Continued compliance is expected.

15A NCAC 02D .0521: Control of Visible Emissions

The facility's flare (ID No. CD-1) is the subject source and was constructed after July 1, 1971. Visible emissions from sources manufactured after July 1, 1971 shall not exceed 20% opacity when averaged over a six-minute period. However, six-minute averages may exceed 20% opacity if no six-minute period exceeds 87% opacity, no more than one (1) six-minute period exceeds 20% opacity in any hour, and no more than four (4) six-minute periods exceed 20% opacity in any 24-hour period. DAQ inspectors have not noted any visible emissions during site visits. Continued compliance is expected.

15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart XXX

The MSW landfill (ID No. ES-1) is the subject source. On March 26, 2018, the Division of Waste Management, Solid Waste Section, issued a Permit to Construct for the Phase 3 and 4 lateral expansions. With that permit, the Solid Waste Section also granted a request to increase the permitted design capacity of the landfill.

Construction commenced for the Phase 3 expansion on May 9, 2018, and the landfill became subject to the requirements of NSPS Subpart XXX on that date. The facility submitted the required initial Design Capacity and initial NMOC emission rate report on August 3, 2018, and the NMOC emission rate was calculated at 867.5 Mg/yr. NMOC emissions will likely exceed the 34 Mg/yr threshold which triggers the requirement for the facility to submit a GCCS design plan, based on previous reporting required when the landfill was subject to NSPS Subpart WWW:

Estimated 5-year NMOC Emission Rates from Report Dated December 14, 2016

Year	LFG Extraction Rate (scfm)	Controlled LFG Emission Rates (Mg/yr)	LandGEM Emission Rates (Mg/yr)	Total NMOC Emission Rate (Mg/yr)
2016	615	18.79	21.30	40.09
2017	615	18.79	23.77	42.56
2018	615	18.79	26.13	44.92
2019	615	18.79	28.37	47.15
2020	615	18.79	30.50	49.28

Revised NMOC Emission Rate from Report Dated March 27, 2018

Year	LFG Extraction Rate (scfm)	Controlled LFG Emission Rates (Mg/yr)	LandGEM Emission Rates (Mg/yr)	Total NMOC Emission Rate (Mg/yr)
2017	539	16.47	23.96	40.43

The facility has elected to conduct a Tier 2 test and has submitted a test protocol with plans to conduct the test and submit the results no later than January 30, 2019. If the results of that test reveal that the NMOC emission rate exceeds the 34 Mg/yr threshold, the facility may either conduct follow-up testing using the Tier 3 and 4 methodologies, or submit a GCCS design plan.

The facility does currently have a GCCS installed in parts of the landfill, but is not yet subject to the monitoring, recordkeeping, or reporting requirements of NSPS Subpart XXX. Once the facility becomes subject to the requirement to install the GCCS, based on the NMOC emission rate, it will have 12 months to submit a GCCS design plan, and 30 months to install and commence operation of the GCCS, both deadline begin at the date of the first report showing the threshold has been exceeded. The permit condition contains provisions allowing for continued testing, as well as requirements for installation and operation of the GCCS with applicable timelines. Compliance is expected.

15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions

This regulation is state-enforceable only and is applicable facility-wide. The facility shall not be operated without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary. The facility has voluntarily installed and operates a GCCS for odor control, among other reasons. DAQ inspectors have not noted any odors beyond the property boundaries during previous inspections, and neither the facility nor DAQ have received any complaints from nearby residents. Continued compliance is expected.

15A NCAC 02Q .0711: Emission Rates Requiring a Permit and
15A NCAC 02D .1100: Control of Toxic Air Pollutants

These rules are state-enforceable only and are applicable facility-wide. The facility may not exceed any of the listed Toxic Permitting Emission Rates (TPERs) without first obtaining an air quality permit. There is an expected increase in toxic emissions from the facility due to increases in the permitted waste acceptance rate and in the permitted design capacity. A LandGEM model supplied by the facility now shows that the LFG generation rate will peak in CY2025, using the maximum waste acceptance rate. Using these assumptions, the maximum LFG generation rate at the earliest closure date is 61,659,948 m³ per year or 4,143 scfm, though the landfill is unlikely to place waste at this rate. The flare, rated at 2,500 scfm, has not been replaced, so those emissions estimations remain unchanged. Toxic air pollutant generation rates were calculated using the methodology of AP-42 Chapter 2.4, and pollutant concentrations from the Waste Industry Air Coalition (WIAC).

In addition to historical waste acceptance records, the facility used the following parameters in LandGEM to determine the LFG generation rate:

Parameter	Value
Landfill Open Year	2001
Anticipated Landfill Closure Year	2024 (at maximum waste acceptance rate)
Design Capacity (Short Tons)	11,495,514
Waste Acceptance Rate (TPY)	Historical, plus 921,000 TPY projection (based on permitted maximum)
Methane Generation Rate (year ⁻¹)	0.040
Potential Methane Generation Capacity (m ³ /Mg)	100
NMOC Concentration (ppmv)	600
Methane Content (%)	50
Peak LFG Generation Rate (m ³ /yr)	61,659,948

WIAC Molecular Weights and Concentrations:

Constituent	Molecular Weight (grams/gmole)	Concentration (ppmv)
1,1,1-Trichloroethane (Methyl Chloroform)	133.41	0.168
1,1,2,2-Tetrachloroethane	167.85	0.005
1,1-Dichloroethene (Vinylidene Chloride)	96.94	0.092
1,2 Dibromoethane (Ethylene Dibromide)	187.88	0.005
1,2-Dichloroethane (Ethylene Dichloride)	98.96	0.120
2-Butanone (MEK)	72.11	12.694
4-Methyl-2-Pentanone (MIBK)	100.16	0.750
Acrylonitrile	53.06	0.036
Benzene	78.11	0.972
Carbon Disulfide	76.13	0.221
Carbon Tetrachloride	153.84	0.007
Chlorobenzene	112.56	0.227
Dichlorobenzene	147.00	1.448
Dichloromethane (Methylene Chloride)	84.94	3.395
Ethyl Mercaptan	62.13	0.226
n-Hexane	86.18	2.063
Hydrogen Sulfide	34.08	23.578
Mercury (total)	200.61	3.00×10^{-4}
Methanethiol (Methyl Mercaptan)	48.11	1.266
Perchloroethylene (Tetrachloroethene)	165.83	1.193
Toluene	92.13	25.405
Trichloroethylene (Trichloroethene)	131.40	0.681
Trichloromethane (Chloroform)	119.39	0.010
Vinyl Chloride	62.50	1.077
Xylene (all isomers)	106.16	16.582

The following example calculation is for the emission of hydrochloric acid (HCl) created from the combustion of the chlorine compounds in the landfill gas-fired flare. The best methods to estimate emission are mass balance methods using site specific data on total chloride [expressed in ppmv as the chloride ion (Cl^-)]. [AP-42, Section 2.4.4.2 – Controlled Emissions]

- Current flare design rating = 2,500 $\text{ft}^3/\text{minute}$ (or $70.8 \text{ m}^3/\text{min} = 4,248 \text{ m}^3/\text{hour}$)
- Methane is only 50% of this gas stream ($2,124 \text{ m}^3/\text{hour}$)
- Q_{Cl^-} = Emission rate of chloride ions, m^3/hour
- C_{Cl^-} = Concentration of chloride ions (42.0 ppmv, AP-42 default value)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of chloride ions = 35.45 g/gmole

$$Q_{\text{Cl}^-} = 2.0 \times Q_{\text{CH}_4} \times \left(\frac{C_{\text{Cl}^-}}{1 \times 10^6} \right) \text{ (AP-42, Equation 3)}$$

$$Q_{\text{Cl}^-} = 2.0 \times 2,124 \frac{\text{m}^3}{\text{hour}} \times \left(\frac{42.0 \text{ parts}}{1 \times 10^6} \right) = 0.18 \frac{\text{m}^3}{\text{hour}}$$

The mass of the pre-combustion chloride ions present in the methane were found using Equation 4 of AP-42, Section 2.4.4.2.

$$UM_{Cl^-} = 0.18 \frac{m^3}{hour} \times \left[\frac{35.45 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \frac{m^3 \cdot atm}{gmol \cdot K} \times 1000 \frac{g}{kg} \times (273 + 25^\circ C) K} \right] \times 2.2 \frac{pounds}{kg}$$

$$UM_{Cl^-} = 0.57 \frac{pounds}{hour}$$

To calculate the HCl from the chloride ions, Equation 10 of Section 2.4-8 was used.

$$HCl_{emissions} = UM_{Cl^-} \times \frac{\eta_{col}}{100} \times 1.03 \times \frac{\eta_{cnt}}{100}$$

Where:

UM_{cl} = Uncontrolled mass emission of Cl^- ions

η_{col} = Collection efficiency of the landfill gas collection system, percent (100%)*

η_{cnt} = Control efficiency of the landfill gas control flare (100%)*

* To calculate worst-case HCl emissions, the facility assumes that 100% of the generated Cl^- ions are collected and converted to HCl rather than using the default 75% 98% collection and control efficiencies.

$$HCl_{emissions} = 0.57 \frac{lb \text{ } Cl^-}{hour} \times \frac{100}{100} \times 1.03 \times \frac{100}{100} = 0.59 \frac{lb \text{ HCl}}{hour}$$

The total emissions of other pollutants from the landfill and flare were calculated using AP-42 Section 2.4-6 Equation 5:

$$CM_p = \left[UM_p \times \left(1 - \frac{\eta_{col}}{100} \right) \right] + \left[UM_p \times \frac{\eta_{col}}{100} \times \left(1 - \frac{\eta_{cnt}}{100} \right) \right]$$

Where:

CM_p = Controlled mass emissions of pollutant

UM_p = Uncontrolled mass emission of pollutant

η_{col} = Collection efficiency of the landfill gas collection system, percent (75%)

η_{cnt} = Control efficiency of the landfill gas control flare (98%)

Example calculation for toxic air pollutant benzene (lbs/yr):

Projected emission rate, using Equations 3 & 4, from the landfill for benzene = 421.2 lb/year

$$CM_p = \left[421.2 \frac{lb}{year} \times \left(1 - \frac{75}{100} \right) \right] + \left[421.2 \frac{lb}{year} \times \frac{75}{100} \times \left(1 - \frac{98}{100} \right) \right] = 111.6 \frac{lb}{year}$$

The calculation above for benzene does not consider the operational limitations of the flare, meaning that the peak LFG generation rate is expected to exceed the currently installed flare's maximum capacity at some point in the future, and a larger flare will likely be installed when that occurs. Flare emissions in the following are based on the maximum operating capacity of the current flare.

The projected toxic emissions through closure, and comparison to their respective TPERs from 02Q .0711(a) are as follows:

Toxic Air Pollutant	Averaging Period	Landfill Volume Emissions	Flare Emissions	Total	TPER	Modeling Required?
1,1,1-Trichloroethane (Methyl Chloroform)	lb/day	8.52×10^{-2}	4.11×10^{-3}	8.93×10^{-2}	250	No
	lb/hr	3.55×10^{-3}	1.71×10^{-4}	3.72×10^{-3}	64	No
1,1,2,2-Tetrachloroethane	lb/yr	1.16	0.056	1.22	430	No
1,1-Dichloroethene (Vinylidene Chloride)	lb/day	3.39×10^{-2}	1.64×10^{-3}	3.55×10^{-3}	2.5	No
1,2-Dibromoethane (Ethylene Dibromide)	lb/yr	1.30	0.063	1.36	27	No
1,2-Dichloroethane (Ethylene Dichloride)	lb/yr	16.47	0.80	17.27	260	No
2-Butanone (MEK)	lb/day	3.48	0.17	3.65	78	No
	lb/hr	0.14	7.00×10^{-3}	0.15	22.4	No
4-Methyl-2-pentanone (MIBK)	lb/day	0.29	0.014	0.30	52	No
	lb/hr	1.19×10^{-2}	5.74×10^{-4}	1.25×10^{-2}	7.6	No
Acrylonitrile	lb/day	7.26×10^{-3}	3.51×10^{-4}	7.61×10^{-3}	0.4	No
	lb/hr	3.02×10^{-4}	1.46×10^{-5}	3.17×10^{-4}	0.22	No
Benzene	lb/yr	105.30	5.08	110.38	8.1	YES
Carbon Disulfide	lb/day	6.39×10^{-2}	3.10×10^{-3}	6.70×10^{-2}	3.9	No
Carbon Tetrachloride	lb/yr	1.49	0.072	1.56	460	No
Chlorobenzene	lb/day	9.71×10^{-2}	4.69×10^{-3}	0.10	46	No
Chloroform	lb/yr	1.66	0.080	1.74	290	No
p-Dichlorobenzene	lb/hr	3.37×10^{-2}	1.63×10^{-3}	3.53×10^{-2}	16.8	No
Dichloromethane (Methylene Chloride)	lb/yr	399.97	19.31	419.28	1600	No
	lb/hr	4.57×10^{-2}	2.20×10^{-3}	4.79×10^{-2}	0.39	No
Ethyl Mercaptan	lb/hr	2.22×10^{-3}	1.07×10^{-5}	2.23×10^{-3}	0.025	No
n-Hexane	lb/day	0.68	0.033	0.71	23	No
Hydrogen Chloride	lb/hr	-----	0.59	0.59	0.18	YES
Hydrogen Sulfide	lb/day	3.05	0.15	3.20	1.7	YES
Mercury (alkyl)	lb/day	2.29×10^{-4}	1.10×10^{-5}	2.40×10^{-4}	0.0013	No
Mercury Vapor	lb/day	-----	5.41×10^{-4}	5.41×10^{-4}	0.013	No
Methanethiol (Methyl Mercaptan)	lb/hr	9.64×10^{-3}	4.66×10^{-4}	0.010	0.013	No
Tetrachloroethylene (Perchloroethylene)	lb/yr	274.39	13.25	287.64	13000	No
Toluene	lb/day	8.09	0.43	8.52	98	No
	lb/hr	0.37	0.019	0.39	14.4	No
Trichloroethylene	lb/yr	124.11	5.99	130.10	4000	No
Vinyl chloride	lb/yr	93.36	4.51	97.87	26	YES
Xylene	lb/day	6.69	0.32	7.01	57	No
	lb/hr	0.28	0.013	0.29	16.4	No

Emissions of benzene, hydrogen chloride, hydrogen sulfide, and vinyl chloride exceed their respective TPERs, requiring further analysis to demonstrate compliance with the AALs. Dispersion modeling was previously conducted by DAQ in 2014, however, volume emissions from the landfill were attributed to the entire property. For this review, the model was refined, and an area source enclosed by the landfill boundaries where waste is/will be placed was modeled rather than treating the entire property as an area source of toxic emissions.

The modeling was performed by DAQ at the request of the facility, and resulted in the following impacts:

Pollutant	Modeled Emission Rate (lb/hr)		Concentration at Property Boundary ($\mu\text{g}/\text{m}^3$)	AAL ($\mu\text{g}/\text{m}^3$)	% AAL
	Landfill	Flare			
Benzene	0.0124	6.00×10^{-4}	0.033	0.12	28%
Hydrogen Chloride	-----	0.5921	7.31	700	1%
Hydrogen Sulfide	0.1316	6.40×10^{-3}	3.15	120	3%
Vinyl Chloride	0.011	5.00×10^{-4}	0.029	0.38	8%

Since none of the toxic air pollutants emitted from the facility exceed their respective TPERs or AALs, DAQ has determined that there is not an unacceptable risk to human health.

The following emission limits have been included in the permit, and are based on the modeled emission rates:

Source Description	Toxic Air Pollutant	Emission Limit
Landfill (ES-1) Fugitive emissions	Benzene	108.62 lb/yr
	Hydrogen chloride	-----
	Hydrogen sulfide	3.16 lb/day
	Vinyl chloride	96.56 lb/yr
Candlestick flare (CD-1)	Benzene	5.26 lb/yr
	Hydrogen chloride	0.59 lb/hr
	Hydrogen sulfide	0.15 lb/day
	Vinyl chloride	4.66 lb/yr

The emission limits are based on the projected peak emission rates through closure of the landfill, with the GCCS operational, and the maximum operating capacity of the currently installed flare. Compliance with these limits is expected when the GCCS and flare are properly maintained and operated.

8. Other Regulatory Requirements

- A Zoning Consistency Determination is NOT required for this permit application.
- The application was sealed by Juene K. Franklin, who is a registered Professional Engineer in the State of North Carolina (Seal #041075).
- The permit modification application fee of \$929 was received by the Fayetteville Regional Office.

9. Emissions Review

The facility's potential emissions are as follows:

Pollutant (tpy) → Source ↓	PM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC	Total HAPs
Landfill Volume Emissions (ES-1)	--	--	--	--	--	--	9.39	4.30
Landfill Gas Collection and Control System & Flare (CD-GCCS1 & CD-1)	5.58	5.58	5.58	2.54	22.61	103.06	0.45	2.80
Diesel Fuel Storage Tanks (IES-2A)	--	--	--	--	--	--	1.4 x 10 ⁻²	1.4 x 10 ⁻²
Gasoline Storage Tank (IES-3B)	--	--	--	--	--	--	0.24	0.24
Leachate Tanks (IES-4A)	--	--	--	--	--	--	1.27	1.27
Total	5.58	5.58	5.58	2.54	22.61	103.06	11.36	8.62

Actual emissions for the landfill as reported on the annual emission inventories can be viewed in the table on page 1 of this document.

MSW Landfill:

The landfill volume emissions were calculated using the peak LFG generation rate of 61,659,948 m³/yr from the LandGEM output, pollutant concentrations from the Waste Industry Air Coalition (WIAC), and the methodology from AP-42 Chapter 2.4 (November 1998). HAP and VOC emissions were calculated using the totals of pollutant emissions for those pollutants classified as HAPs or VOCs. Post collection and control potential emissions were calculated by applying a collection efficiency of 75% and a destruction efficiency of 98%.

Flare:

VOC emissions for the flare are based on the maximum capacity of the flare, regardless of LFG generation rate from the landfill, and 98% control efficiency.

Particulate, NO_x, and CO emissions were calculated using the following emission factors:

PM: 17 lb/10⁶ ft³ CH₄ (AP-42 2.4-5)

NO_x: 0.068 lb/mmBtu (AP-42 13.5-1)

CO: 0.31 lb/mmBtu (AP-42 13.5-2)

The flare is rated for 75.9 mmBtu/hr at 1,250 ft³ CH₄ per minute (657 million ft³ CH₄ per year), with a heat value of 506 Btu per cubic foot of landfill gas.

Examples:

$$\frac{657 \text{ million ft}^3 \text{ CH}_4}{\text{year}} \times \frac{17 \text{ pounds}}{\text{million ft}^3 \text{ CH}_4} \times \frac{1 \text{ ton}}{2000 \text{ pounds}} = 5.58 \frac{\text{tons PM}}{\text{year}}$$

$$\frac{75.9 \text{ mmBtu}}{\text{hour}} \times \frac{0.068 \text{ pounds NO}_x}{\text{mmBtu}} \times \frac{8,760 \text{ hours}}{\text{year}} \times \frac{1 \text{ ton}}{2000 \text{ pounds}} = 22.61 \frac{\text{tons NO}_x}{\text{year}}$$

All particulate emissions from the combustion of landfill gas are considered as PM_{2.5}.

To calculate potential SO₂ emissions, AP-42 Chapter 2.4 was used along with information submitted by the facility in the application:

- Current flare design rating = 2,500 ft³/minute (or 70.8 m³/min = 4,248 m³/hour)
- Methane is only 50% of this gas stream (2,124 m³/hour)
- Q_S = Emission rate of reduced sulfur compounds, m³/hour
- C_S = Concentration of reduced sulfur compounds (23.578 ppmv, as H₂S)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of sulfur = 32.06 g/mole

$$Q_s = 2.0 \times Q_{\text{CH}_4} \times \left(\frac{C_s}{1 \times 10^6} \right) \text{ (AP-42, Equation 3)}$$

$$Q_s = 2.0 \times 2,214 \frac{\text{m}^3}{\text{hour}} \times \left(\frac{23.578 \text{ parts}}{1 \times 10^6} \right) = 0.1002 \frac{\text{m}^3}{\text{hour}}$$

The mass of the pre-combustion sulfur compounds present in the methane were found using Equation 4 of AP-42, Section 2.4.4.2.:

$$UM_s = 0.1002 \frac{\text{m}^3}{\text{hour}} \times \left[\frac{32.06 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \frac{\text{m}^3 \cdot \text{atm}}{\text{gmol} \cdot \text{K}} \times 1000 \frac{\text{g}}{\text{kg}} \times (273 + 25^\circ\text{C}) \text{ K}} \right] \times 2.2 \frac{\text{pounds}}{\text{kg}}$$

$$UM_s = 0.29 \frac{\text{pounds}}{\text{hour}}$$

To calculate SO₂ emitted from the combustion of sulfur compounds in the flare, Equation 10 of Section 2.4-8 was used.

$$\text{SO}_2 \text{ emitted} = \text{UM}_s \times \frac{\eta_{\text{col}}}{100} \times 2.0$$

Where:

UM_{cl} = Uncontrolled mass emission rate of sulfur compounds (0.29 lb sulfur/hour)

η_{col} = Collection efficiency of the landfill gas collection system, percent*

2.0 = Ratio of the molecular weight of SO₂ to the molecular weight of Sulfur

* To calculate worst-case SO₂ emissions, assume that 100% of the generated sulfur compounds are collected and converted to SO₂.

$$\text{SO}_2 \text{ emitted} = 0.29 \frac{\text{pounds}}{\text{hour}} \times \frac{100}{100} \times 2.0 \times 8760 \frac{\text{hours}}{\text{year}} \times \frac{1 \text{ ton}}{2000 \text{ pounds}}$$

$$\text{SO}_2 \text{ emitted} = 2.54 \frac{\text{tons SO}_2}{\text{year}}$$

Diesel Fuel and Gasoline Storage Tanks:

VOC and HAP emissions from working and breathing losses from the diesel fuel and gasoline storage tanks are from the permit application and were calculated using TANKS 4.0.9d.

Leachate Tanks:

VOC and HAP emissions from the leachate storage tanks were taken from the permit application and are based on sample data and the influent flow rates of each tank. All VOCs were assumed to be emitted.

10. Source Testing Information

The Anson County Waste Management Facility conducted the latest Tier 2 test on November 14, 2016 and submitted the test report along with a 5-year projection of NMOC emissions. According to that report, NMOC emissions were expected to reach 49.28 Mg/yr in CY2020, however, the waste acceptance rate exceeded the projection in CY2017, and the landfill submitted a revised NMOC report, received by the Fayetteville Regional Office on March 27, 2018, indicating the NMOC emission rate to be 40.43 Mg/yr in CY2017. The facility intends to conduct a Tier 2 test to determine the NMOC emission rate for the purposes of determining whether a GCCS is required to be installed pursuant to NSPS Subpart XXX.

11. Statement of Compliance

The Anson County Waste Management Facility has no negative compliance history. The last compliance inspection was conducted on October 17, 2018 by Mitchell Revels and Jeff Cole, both of FRO DAQ, who found the facility to be operating in apparent compliance.

12. Public Notice Review

A notice of the draft Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA.

The 30-day public notice period was from MONTH XX, 2019 through MONTH XX, 2019.

The EPA 45-day review period was from MONTH XX, 2019 through MONTH XX, 2019.

[Number of] comments were received during the public notice period or the EPA 45-day review.

13. Comments and Recommendations

The permit renewal with modification application for Anson County Waste Management Facility located in Polkton, Anson County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 09835T04.